

REMARKS

Claims 1-16 and 19-20 have been amended. Claims 1-52 are pending in the present application. Applicant reserves the right to pursue the original claims and other claims in this application and in other applications.

The drawings stand objected to because the Office Action states that FIG. 2 fails to show the labels T1 and T2. FIG. 2 has been amended as shown in the attached replacement sheet. Pursuant to the Examiner's request, the labels T1 and T2 have been added to FIG. 2 by this amendment. No new matter has been added. Applicants respectfully request that the objection be withdrawn.

Claim 19 stands objected to as being of improper dependent form. Specifically, the Office Action states that claim 19 recites positive and negative switching elements and is dependent upon claims 4 and 8, which do not recite positive and negative switching elements. Claim 19 has been amended. The amendment addresses the concerns raised in the Office Action. Accordingly, the objection should be removed and claim 19 allowed.

Claims 3-8 and 11-16 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 3-8 and 11-16 have been amended. The concerns raised in the Office Action have been addressed by these amendments. Accordingly, the objection should be removed and claims 3-8 and 11-16 allowed.

Claims 1-20, 25-44 and 49-52 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Proebsting, U.S. Patent No. 5,952,948, in view of Jeong, U.S. Patent No. 6,335,721 B1. The rejection is respectfully traversed and reconsideration is respectfully requested.

Claim 1 recites a drive circuit comprising a plurality of digital-to-analog conversion circuits and a sampling circuit. According to claim 1, "when said sampling circuit selects signal lines, the reference voltage selected by one of said digital-to-analog conversion circuits and/or the reference voltage selected by the other of said digital-to-analog conversion circuits are output to said signal lines via the resistor inserted into any of said circuits and a resistance within said sampling circuit." Applicants respectfully submit that the cited combination fails to teach or suggest the claimed drive circuit.

Proebsting relates to a low power liquid-crystal display (LCD) driver. Proebsting discloses a digital to analog converter (DAC) that contains switches for dividing voltages. Proebsting, however, fails to disclose, teach or suggest a sampling circuit. As such, Proebsting cannot teach or suggest a sampling circuit containing a resistance through which a reference voltage is output as recited in claim 1. The fact that Proebsting does not teach a sampling circuit is acknowledged by the Office Action. Office Action at 3-4. To overcome this deficiency, the Office Action attempts to combine Jeong with Proebsting.

Jeong, which relates to an LCD source driver, discloses a driver circuit comprising two DACs and two sample and hold circuits connected to an output buffer circuit. The Jeong sample and hold circuits, however, fail to teach or suggest a sampling circuit containing a resistance through which a reference voltage is output as recited in claim 1. As such, the cited combination fails to teach or suggest all of the claim elements recited in claim 1.

Moreover, the cited references, even when considered in combination, fail to teach or suggest a sampling circuit having a resistance used to divide a reference voltage being output to a signal line from the sampling circuit. This is a feature of the claimed invention that provides many benefits not obtainable in prior art driver circuits.

The claimed invention, for example, can increase the resistance between the reference voltages, without increasing the resistance between the reference voltages and the signal lines. Moreover, even if the drive circuit is mounted in an image display with a high resolution or high frame rate, it can have reduced power consumption.

Specification Page 29, line 21 to Page 30, line 3. For at least the foregoing reasons, applicant submits that claim 1 is allowable over Proebsting and Jeong.

Claim 2 recites a drive circuit, comprising a plurality of digital-to-analog conversion circuits and a sampling circuit comprising first and second groups of sampling switching elements. According to claim 2, "said first group of sampling switching elements and said second group of sampling switching elements start to conduct one by one in response to a signal line selection signal synchronized with said gradation signal." Consequently, "the reference voltages connected to specified switching elements belonging to one of said digital-to-analog conversion circuits and/or the reference voltages connected to specified switching elements belonging to the other of said digital-to-analog conversion circuits are output to said signal lines via specified conducting switching elements." According to claim 2, "said sampling switching elements divide any reference voltages as they are being output." Applicants respectfully submit that the cited combination fails to teach or suggest the claimed drive circuit.

As set forth above, Proebsting and Jeong fail to teach or suggest resistance or a voltage divider within the sampling circuit. Thus, the cited combination fails to teach or suggest the claimed invention. As noted above with respect to claim 1, by providing resistance and a voltage divider within the sampling circuit, the claimed invention achieves many benefits not achievable by prior art devices. For at least the foregoing reasons, applicant submits that claim 2 is allowable over Proebsting and Jeong.

Claims 3-20, 25-44 and 49-52 recite similar limitations as claims 1 and 2 and are allowable for at least the reasons set forth above and on their own merits. Accordingly, the rejection should be withdrawn and claims 1-20, 25-44 and 49-52 allowed.

Claims 21-24 and 45-48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Proebsting, Jeong and Nakamura, U.S. Patent No. 6,411,273 B1. The rejection is respectfully traversed and reconsideration is respectfully requested.

Claims 21-24 respectively depend from claims 2, 4, 8 and 10. Claims 45-48 respectively depend from claims 41-44. Thus, claims 21-24 and 45-48 contain a sampling circuit discussed above with respect to claims 1 and 2. As set forth above, the combination of Proebsting and Jeong fail to teach or suggest such sampling circuits. Applicants respectfully submit that Nakamura, which has only been cited as disclosing thin film transistors, fails to teach or suggest the recited sampling circuit also. As such, the combination of Proebsting, Jeong and Nakamura fails to teach or suggest all of the elements of claims 21-24 and 45-48. The rejection should be withdrawn and claims 21-24 and 45-48 allowed.

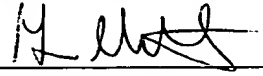
In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

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Respectfully submitted,

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